Technical Paper Series

The GO Message Center

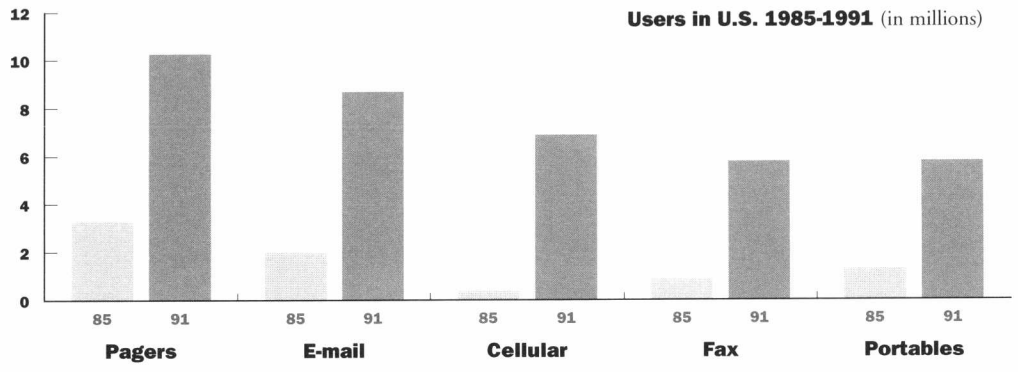
The GO™ Message Center

GO Corporation was founded in 1987 to deliver computing and communications solutions for the unique needs of mobile workers. As part of a broad plan to address those needs, GO is extending its PenPoint™ operating system with the GO Message Center, a collection of object-oriented software components that will allow people to send, receive, and manage many kinds of messages (e-mail, fax, pager, voice) in one consistent way. The GO Message Center includes GO Mail, an AT&T Mail communication link, the GO Address Book, a Dialing Location Sheet, and a system-wide In box and Out box.

The GO Message Center components will be included as a standard part of the PenPoint operating system. These new components will provide immediate messaging capabilities for end users and powerful object-oriented building blocks for software developers.

Mobile Communications

As our society becomes more mobile, the market for communications technologies has exploded. We've become increasingly reliant on pagers, cellular phones, e-mail and fax to keep in touch when we're on the go. Today's business environment demands fast, efficient, and easy-to-use, "anytime, anywhere" communications tools.

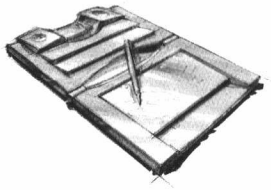


Rapid Growth in Communications

(Source: BIS Strategic Decisions)

Personal Communicators Emerge

These tools are emerging at the convergence of several key computing and communications technologies—pen and paper user interface models, object-oriented software, wireless networking, and low-power, high-performance microprocessors—resulting in completely new hardware and software designs. These "Personal Communicators" will combine personal productivity tools with mobile communications technology—from personal organizers, notetakers, and electronic books, to cellular phones, pagers, fax, e-mail, and even voice mail—integrated in a totally new class of products. They'll revolutionize the way we manage and use information, as well as the way we communicate with each other. Personal Communicators based on PenPoint will use the GO Message Center to let people integrate all their person-to-person communications in one device in one consistent way.



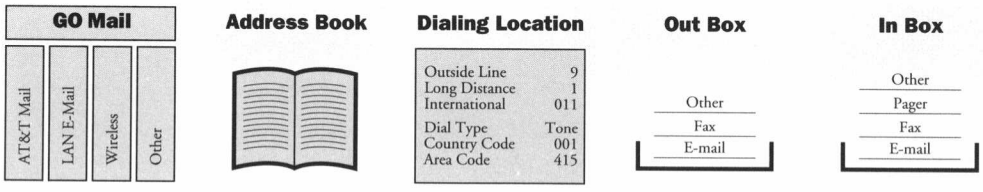
Personal Communicators will combine personal productivity tools with mobile communications technology.

The GO Message Center—for Users and Software Developers

The GO Message Center builds into PenPoint a tightly integrated set of object-oriented messaging components. The GO Message Center includes

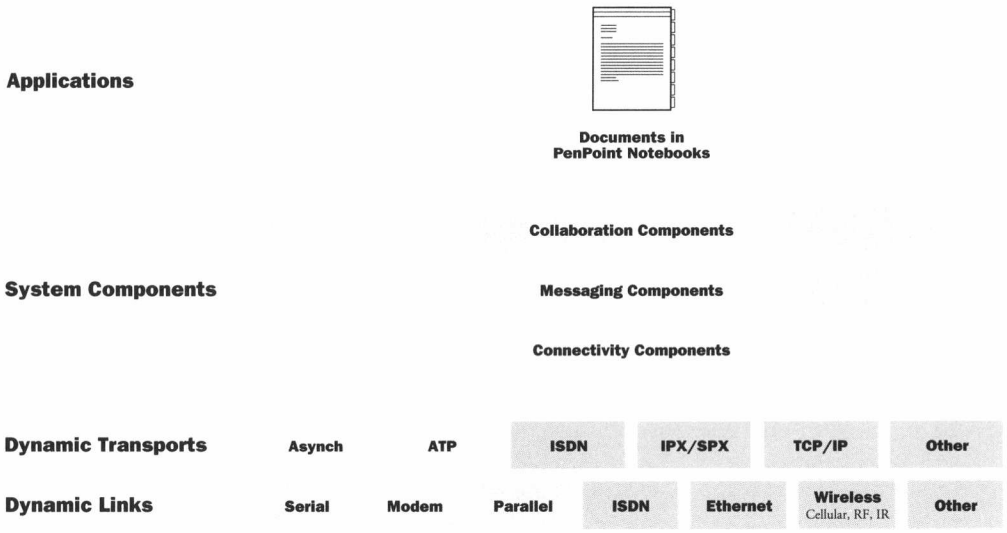
- GO Mail, an electronic mail engine and universal messaging interface that can connect to many message networks through "snap-in" communication links.
- AT&T Mail communication link, providing access to AT&T's worldwide messaging network.
- GO Address Book, a system-wide directory accessible from any PenPoint application.
- Dialing Location Sheet for access to long distance and outside lines, or credit card billing.
- System-wide In box and Out box.

These small, modular components provide end users with immediate value while giving software developers the best possible environment for developing message-based applications. As a standard part of PenPoint, the GO Message Center builds personal communications into every PenPoint device.



The GO Message Center components

The GO Message Center is built on the Mobile Communications Architecture that has been part of PenPoint from its inception:



PenPoint's Mobile Communications Architecture

Communications has been built into PenPoint from the ground up. PenPoint's Mobile Communications Architecture provides deferred I/O, instantaneous background connect/disconnect, and other features optimized for wireless mobile communications.

PenPoint provides a layered Mobile Communications Architecture that offers a high degree of flexibility and insulates both users and application developers from underlying links and transports. PenPoint allows multiple networks to coexist on the same machine. It automatically detects network and peripheral device connection/disconnection, and dynamically loads the proper protocols to make those connections available to the system. By operating in a protected mode, PenPoint insures that if one process fails, other parts of the system will not be disrupted. And PenPoint provides full preemptive multitasking, so your machine isn't tied up while network access is taking place. Establishing wired and wireless network connections is completely transparent to users and applications—no rebooting, no reconfiguring. Just "plug and play".

The new GO Message Center components have been built upon the connectivity foundation introduced in PenPoint 1.0, taking advantage of network detection, DOS file compatibility, and an import/export architecture that can convert file formats as needed.

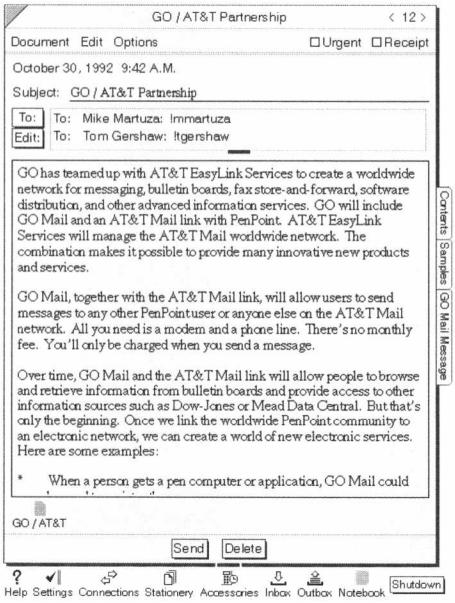
In the future, GO plans to extend PenPoint further with collaboration components that build on the existing connectivity and messaging components.

The GO Message Center—A Look at Each Component

Each of the GO Message Center components works as a unified part of the whole. Here's a more detailed look at each one:

GO Mail

GO Mail is a general purpose messaging application that offers users the simplicity of a single user interface with the flexibility of transparent connections to many messaging networks. GO Mail provides a transport-independent messaging engine designed to work with many message networks through snap-in software modules called "communication links". With GO Mail's simple interface, you can easily send many kinds of messages across many kinds of networks. GO Mail provides one consistent front-end for e-mail, fax, paging and other communications applications, both wired and wireless. It provides basic functionality like send, receive, reply, forward, and attach. GO Mail uses the standard PenPoint gestures and behaviors, and remains true to the familiar pen and paper model. You can see that the message interface looks a lot like a fax cover sheet, with To, Subject, and Memo fields. There's also an attachments area, where documents can be attached to the cover sheet by simply dragging icons onto it.


GO / AT&T Partnership
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October 30, 1992 9:42 A.M.
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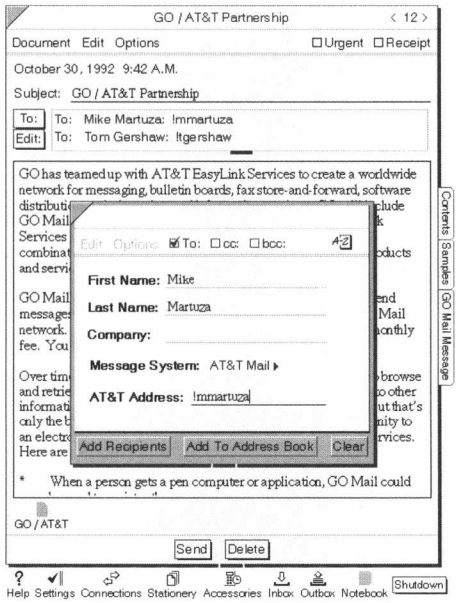
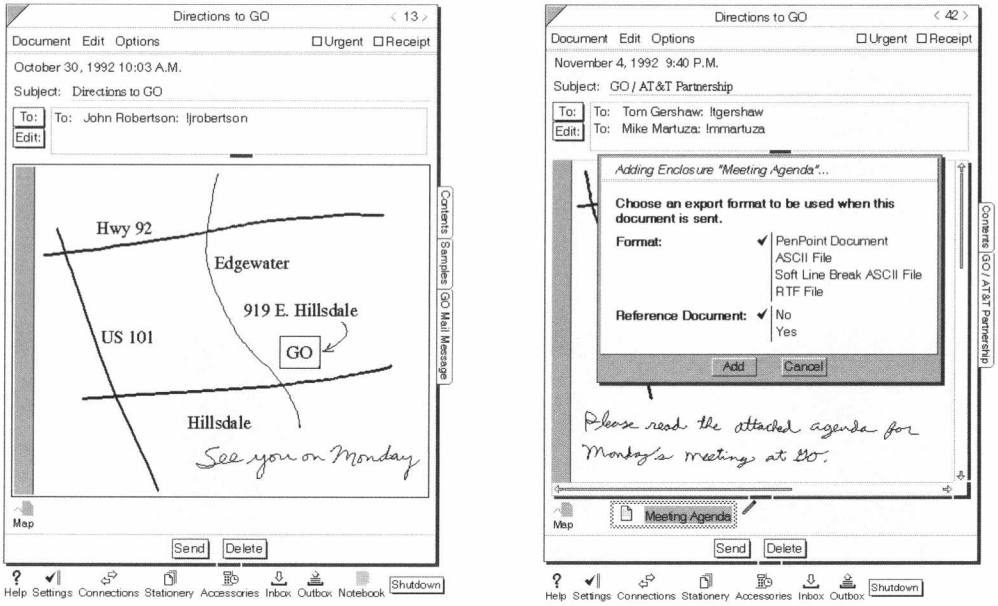
GO has teamed up with AT&T EasyLink Services to create a worldwide network for messaging, bulletin boards, fax store-and-forward, software distribution, and other advanced information services. GO will include GO Mail and an AT&T Mail link with PenPoint. AT&T EasyLink Services will manage the AT&T Mail worldwide network. The combination makes it possible to provide many innovative new products and services.
GO Mail, together with the AT&T Mail link, will allow users to send messages to any other PenPoint user or anyone else on the AT&T Mail network. All you need is a modem and a phone line. There's no monthly fee. You'll only be charged when you send a message.
Over time, GO Mail and the AT&T Mail link will allow people to browse and retrieve information from bulletin boards and provide access to other information sources such as Dow-Jones or Mead Data Central. But that's only the beginning. Once we link the worldwide PenPoint community to an electronic network, we can create a world of new electronic services. Here are some examples:
* When a person gets a pen computer or application, GO Mail could
GO / AT&T
Send
Delete
Contents
Samples
GO Mail Message
Help Settings Connections Stationery Accessories Inbox Outbox Notebook
Shutdown

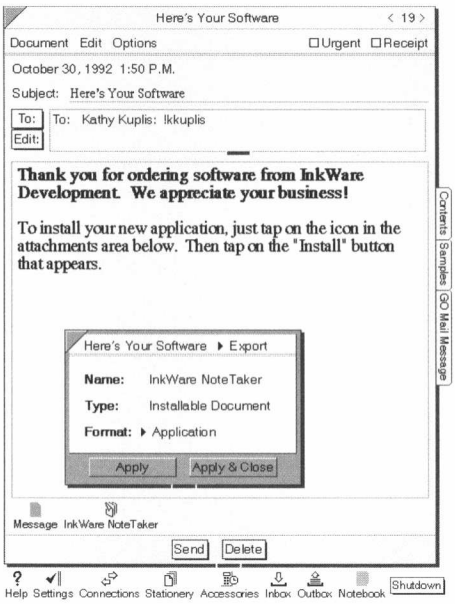


The GO Mail interface does not have a native message editor. Instead, you can use any PenPoint document for the message body. For example, if you want to send text messages, you can use MiniText or an advanced word processor like PenPerfect from WordPerfect. Or if you want to send ink messages, you can use MiniNote or InkWare NoteTaker from Ink Development. You can choose different applications for different messages and GO Mail will make your document look like it was built into the interface. And by invoking the standard PenPoint import/export architecture, GO Mail lets you choose from any export format provided by the message body application.

GO Mail lets you send any PenPoint document: for example, text, graphics, or electronic ink. It can also translate file formats automatically.



With the flexibility to send any document, you can send translated text, or dash off a quick handwritten message that appears as electronic ink on another PenPoint computer. GO is working with other companies to add "ink displayers" to desktop e-mail programs so you'll be able to send electronic ink anywhere. Handwritten electronic ink may in fact become the most common form of executive e-mail. Even those of us who use computers every day still find plenty of reasons to leave handwritten messages for our colleagues. We'll soon be doing the same with Personal Communicators.


Here's Your Software
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To install your new application, just tap on the icon in the attachments area below. Then tap on the "Install" button that appears.
Here's Your Software Export
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Type: Installable Document
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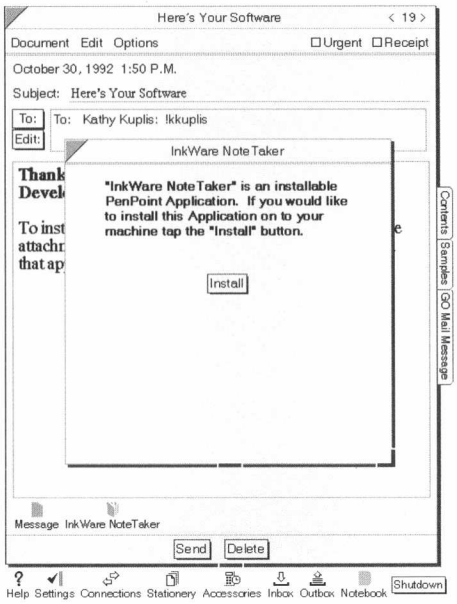
Contents Samples GO Mail Message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Subject: Here's Your Software
To: Kathy Kuplis: lkkuplis
InkWare NoteTaker
"InkWare NoteTaker" is an installable PenPoint Application. If you would like to install this Application on to your machine tap the "Install" button.
Install
Message
InkWare NoteTaker
Send
Delete
Help Settings Connections Stationery Accessories Inbox Outbox Notebook
Shutdown
Contents Samples GO Mail Message

GO Mail makes the electronic distribution of software as easy as mailing a document. To send software, you simply drag an icon into the GO Mail attachments area. To receive and install software, users just tap an "Install" button.

GO Mail makes it easy to mail software electronically. Because PenPoint applications are presented to users as a single entity rather than a collection of files, electronic software distribution is as easy as mailing a document. To send software, simply drag an application icon from the original floppy disk to the GO Mail attachments area. To receive and install software, users just tap an "Install" button. And the small code size fostered by PenPoint's object-oriented design makes electronic distribution affordable.

Communication Links

GO Mail was architected so that the mail engine and user interface are separate from the transport layer. Modules called communication links map the protocols of specific messaging networks like AT&T Mail or Novell MHS to GO Mail. Instead of working with just one mail service, you can install optional links to connect to many different wide area and local area message networks, both public and private. Each link manages the idiosyncrasies of connecting and formatting messages for its service, so users and developers are presented with a single unified view of all messaging networks. Communication links will be sold separately by GO and key partners.

The first communication link, to the worldwide AT&T Mail network, is included free with GO Mail. The AT&T Mail link joins together the entire PenPoint community on a single network for messaging, transactions, software distribution and a wealth of information services. Planned services include store-and-forward fax, bulletin boards, publication databases, electronic business transactions and software distribution.

Through AT&T's network, PenPoint users can communicate via gateways to over 15 million desktop and mobile e-mail users around the world. PenPoint customers pay no fixed monthly fee for access to AT&T Mail. Like stamps on letters, you're charged only for usage.

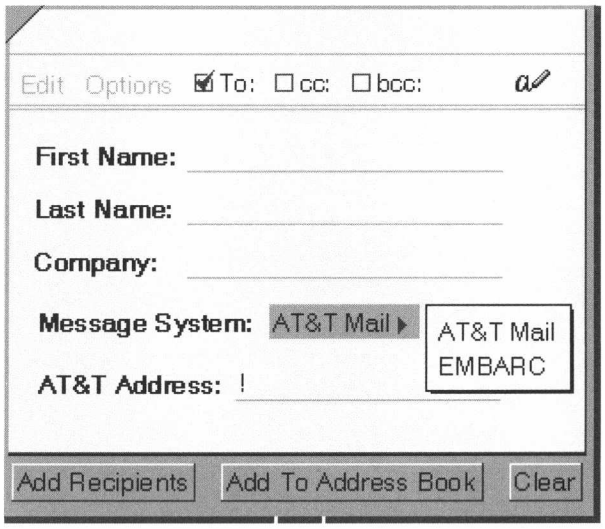
Wireless Communication Links Enable "Anytime, Anywhere" Communications

The communications needs of mobile workers are quite distinct from those of traditional desktop workers. For example, mobile users need to connect to LANs and WANs on the fly, send ad hoc electronic messages, and communicate with people on a variety of different communications platforms. Because mobile workers don't stay in one place, they will depend increasingly on wireless communications. Technologies like infrared and spread spectrum radio will link users in buildings to local area networks. Worldwide paging, cellular, and radio frequency networks will keep users in touch anywhere they go. Managing these connections must take place in the background without interrupting the user.

GO will offer communication links to several wireless messaging networks in 1993, including Motorola EMBARC, SkyTel, and RAM Mobile Data services.

Some of these technologies are in place today. Circuit cellular technology used for voice calls is increasingly being used for transmitting data, especially as error correction protocols like MNP 10 make data transmission more reliable. Both Motorola's EMBARC and SkyTel's wireless (paging frequency) networks allow you to broadcast messages all over North America. ARDIS and RAM Mobile Data offer two-way packet radio networks that can be used for data transfer or messaging. IBM and several cellular carriers are implementing CelluPlan II, a plan to upgrade the existing cellular network with packet cellular technology for reliable two-way data transmission. CelluPlan II, also known as Cellular Digital Packet Data (CDPD), will be field tested in the first half of 1993, with full implementation planned for some networks by the end of the year.

GO will offer communication links to several wireless messaging networks in 1993, including Motorola EMBARC, SkyTel, and RAM Mobile Data services. PenPoint was designed to work seamlessly with such networks. Automatic network detection lets people roam in and out of wireless networks, connecting transparently when available. As a wireless user you can "send" messages even when out of connection range. Your messages get queued in the Out box. When you walk into range, PenPoint transparently establishes the connection. The Out box routes messages on their way, and the In box is open to receive. Preemptive multitasking insures that documents can come and go in the background while you continue working. And PenPoint's import/export architecture allows documents to be converted to the proper formats.

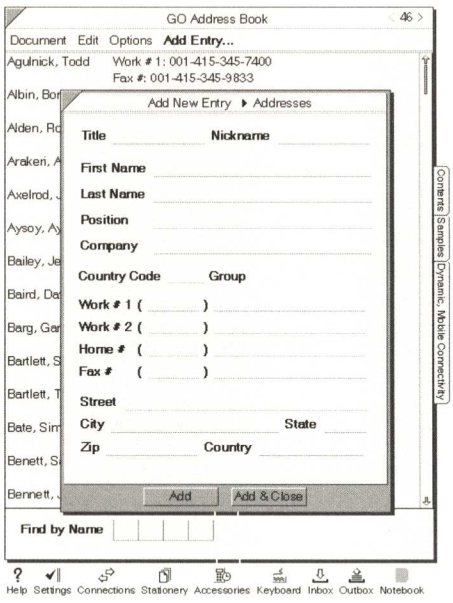


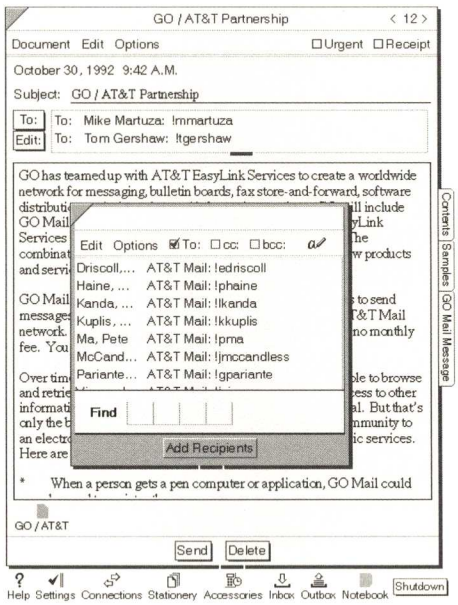
GO Address Book

The GO Address Book is a directory application for storing names, addresses, phone numbers, fax numbers, e-mail addresses, and others. Since it uses the PenPoint Address Book Protocol, it serves as a single directory to store and retrieve addresses for any PenPoint application. The Address Book is available across all PenPoint applications and simplifies address management for users. All addressing information can be managed in a single place. And software developers benefit by leveraging existing code—there's no need to develop proprietary address books. Developers and users can create customized "views" of the address book to see only the information they need.

Providing a standard API for a local address directory means that users will be able to choose their favorite address book or personal organizer. Pensoft's Perspective is an example of an intelligent personal organizer that can replace the basic address book provided by GO. The addresses you store in any compliant address book will be available to any PenPoint application. And since address books are documents in PenPoint, you can mail them to others. Information Systems Managers may want to mail department or company address books to users on a regular basis. Because PenPoint has defined an API for reading and writing addresses to a system-wide directory, GO Mail will be able to synchronize directory services from network servers in the future.

When new communication links are added to the GO Message Center, the Address Book automatically generates new address fields for each entry. Entries can be grouped, to simplify sending or faxing to mailing lists. And the Address Book supports tab and comma delimited import and export, so it's easy to keep your addresses compatible with external address books.

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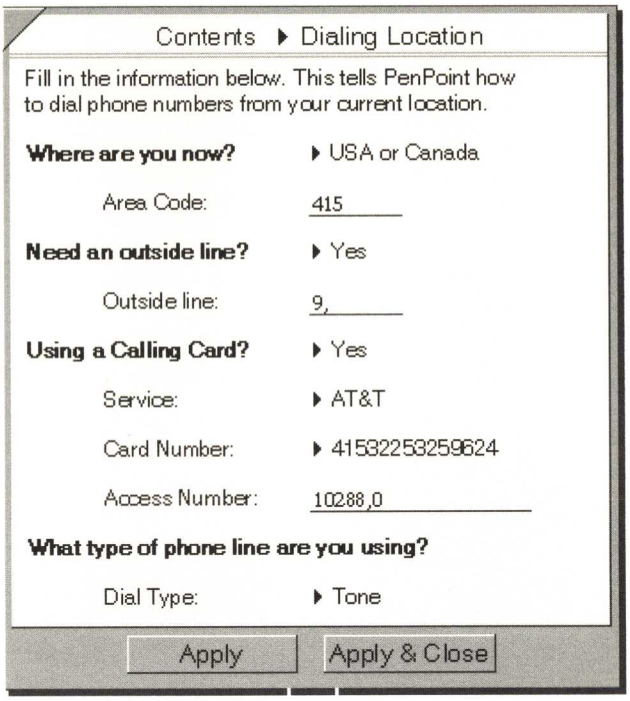
Find
Add Recipients
When a person gets a pen computer or application, GO Mail could
GO / AT&T
Send
Delete
Contents Samples GO Mail Message
Help Settings Connections Stationery Accessories Inbox Outbox Notebook
Shutdown

Software developers can use the Address Book component to provide a view of the directory data from within any application. GO Mail uses such a view to allow users to address e-mail messages.

Dialing Location Sheet

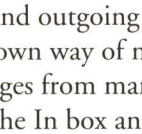
Ideal for automated dialing, the Dialing Location Sheet lets you specify your current area code and country code so that when you pick a fax or phone number from your Address Book, the PenPoint operating system intelligently dials the numbers you need. For example, let's say you need to fax two people, one local and one long-distance. PenPoint automatically ignores the local area code for the first fax number, but intelligently dials the long distance area code for the second fax number.

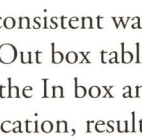
You can also specify outside line access, for example, dialing 9 to get an outside line from inside a business. Choose calling card services such as AT&T, MCI, or Sprint, and automatically charge calls to credit card numbers. The Dialing Location Sheet simplifies and automates your interaction with telephone networks.

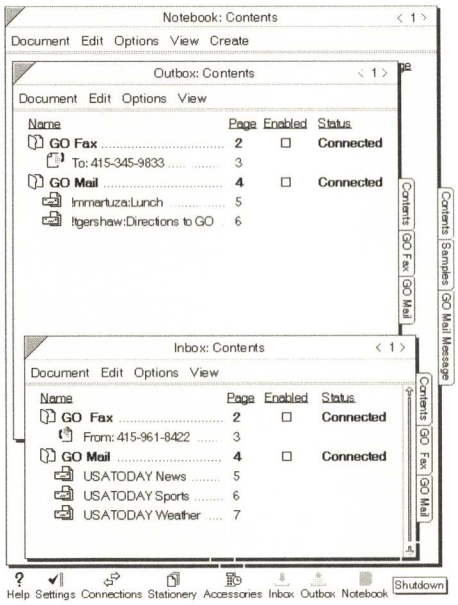


In box, Out box

PenPoint's system-wide In box and Out box provide users with one easy way to manage all incoming and outgoing messages. On other systems, every communications application has its own way of managing messages. But Personal Communicators have to manage messages from many systems, including fax, public e-mail, LAN-based e-mail, and paging. The In box and Out box manage all of these and more, in one convenient place, in one consistent way. Incoming and outgoing messages of all types are listed in the In box or Out box table of contents—just like the familiar Notebook table of contents. In fact, the In box and Out box code are subclasses of the Notebook table of contents application, resulting in very little additional code in PenPoint.



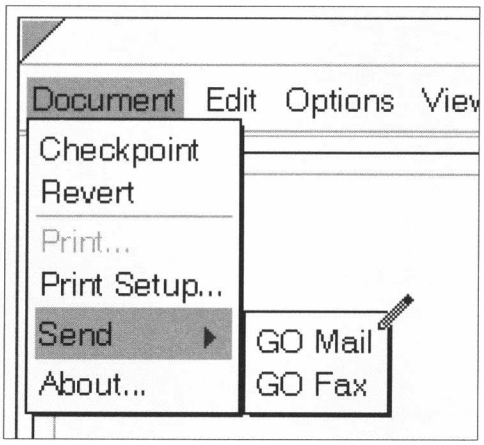




The In box and Out box interact transparently with the communication links that you have installed on your system. A single message may cause the Out box to dial or otherwise connect to several different message servers (AT&T Mail, Novell MHS, etc.). Communication links will convert your message to the format expected by the connected message server, emptying your Out box and filling your In box in the background. Connections to mail servers can even be scheduled to happen automatically at times you select.

Simple Mail-Enabling is Automatic in PenPoint

A debate is raging today about which mail APIs are best for building mail-enabled applications. Lotus is promoting its Vendor Independent Messaging (VIM) specification and has enlisted the support of IBM, Apple, Novell, Borland, and WordPerfect. Microsoft is promoting its Messaging Application Programming Interface (MAPI) for Windows. And the X/Open API Association (XAPIA) is also working to establish a standard set of mail APIs.

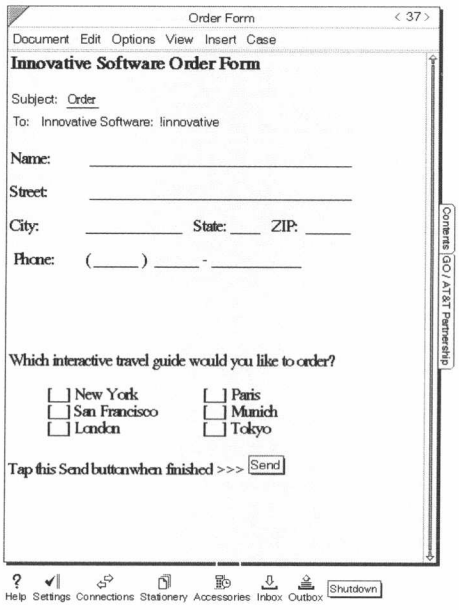


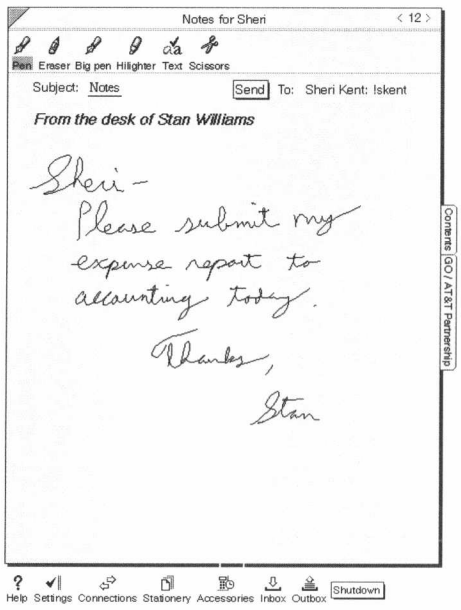
In PenPoint, much of the debate about mail APIs is irrelevant. The most common use of mail APIs on other systems will be for software developers to add a Send command to their applications. With other mail systems, a developer must sit down with the API specification and write code that adds a Send command and addressing functions to their application. Under PenPoint, software developers get that functionality without writing any code.

In PenPoint, all documents inherit a "Send" command through PenPoint's object hierarchy—the Application Framework. So within any document you can send faxes and e-mail with a tap of the pen. A consistent user interface pops up, allowing the user to quickly address a message and send it on its way. No other operating system provides such support to developers or consistency to users.

Object-Oriented Mail-Enabling

With PenPoint's object-oriented design, users can easily create customized messaging interfaces. GO Mail's user interface elements—the Send button, recipient list, and Subject field—can be copied into any PenPoint document.

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Please submit my expense report to accounting today.
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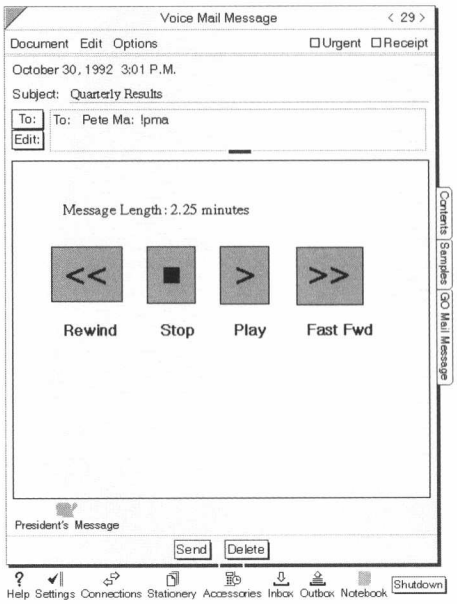
Contents GO / AT&T Partnership
Help Settings Connections Stationery Accessories Inbox Outbox Shutdown

Going beyond simple mail-enabling (i.e., adding a Send command), PenPoint provides a rich set of object-oriented benefits to users and software developers. End users can create customized pre-addressed documents in seconds by simply copying the "Send" button and recipient list from the GO Mail user interface to any PenPoint document. When the user then taps that new "Send" button, the document mails itself to the specified addresses. So a merchant can easily create a self-addressed order form with an embedded "Send" button, and mail that form to a list of customers. The customers simply fill out the form and tap Send, immediately returning their order to the merchant.



The GO Message Center components are reusable, replaceable, and subclassable. Each component has published APIs and can be reused by other applications. Any PenPoint application from any developer can reuse the GO Mail user interface and mail engine, the system-wide Address Book, the Dialing Location Sheet, and the In box or Out box. The result of all this code reuse is simpler, smaller applications, and a more logical, consistent user model.

Because GO Mail allows any document to be its message body, users can choose their favorite text or ink processors as the editor in GO Mail. This flexibility will also allow new media types to be supported easily. Instead of a text or ink message, imagine a message body that has tape recorder controls—play, rewind, and fast forward. Such an audio application can easily be substituted as the message body to fully integrate sound or voice mail messages into GO Mail. Video could be supported in a similar way.

GO Message Center components can be replaced by API-compliant modules, providing unlimited opportunity for third party development. The replacements work seamlessly with the remaining messaging components. For example, Pensoft's Perspective can very easily replace the basic address book supplied by GO. Even the GO Mail interface is replaceable and subclassable. By subclassing the existing GO Mail interface, a software developer could offer a different messaging interface that works seamlessly with existing communication links, address books, and other components.

While PenPoint's Send command makes communications readily accessible to users, developers may wish to access the messaging components programatically. For example, a note-writer or PIM application might automatically pull addressing information from the Address Book. A corporate developer might automate the transmission of information from the field back to corporate computers at a scheduled time each day, programatically sending data via the GO Message Center to a pre-addressed destination at corporate headquarters.

Through object-oriented APIs, PenPoint developers can move beyond simple mail-enabling to write innovative applications that build on the messaging components. They can be assured that as new communication links are added and components replaced, their applications will remain fully functional. The GO Message Center lets applications access a broad range of communications services, while minimizing the code a developer must write.

Partners in Mobile Messaging

Key partners have created products that work with the GO Message Center to enhance mobile communications and productivity—and many more products are on the way. Network and service providers such as AT&T, Novell, Motorola, SkyTel and RAM Mobile Data are building the infrastructure for truly mobile communications. And innovative software developers are joining GO to create exciting communications-oriented applications.

GO and AT&T are building the infrastructure for Personal Communicators. This worldwide communications network will offer messaging, business transactions, electronic software distribution and a wealth of information services. The GO Message Center includes access to this network, linking PenPoint users to each other and to desktop and mobile e-mail systems around the world.

Communications Partners

AT&T

GO and AT&T are building the infrastructure for Personal Communicators. By including access to the AT&T Mail network free with PenPoint, all PenPoint users will joined in an electronic community for messaging, transactions, software distribution and many other information services. Planned services include store-and-forward fax, bulletin boards, publication databases, electronic business transactions and software distribution.

Novell

In addition to the AT&T public mail network, GO Mail will connect to wide area and local area mail networks. Novell is working with GO to build an MHS link, allowing PenPoint users to connect to a large, growing base of MHS networks. Da Vinci eMail, Beyond Mail, and Reach MailMan are examples of products that use the MHS transport. MHS is also widely used as a gateway mechanism to other mail systems like cc:Mail and Microsoft Mail.

Motorola

Motorola and GO are developing an EMBARC communication link, providing PenPoint users with wireless communications capabilities across North America and around the world. EMBARC (Electronic Mail Broadcast to A Roaming Computer) is a wireless messaging service introduced in mid-1992 by Motorola. The service uses advanced paging technology, computer software and satellite transmission to deliver wireless data to one or thousands of desktop and mobile computer users. EMBARC also provides free USA Today news services.

SkyTel

SkyTel Corporation, the leading nationwide pager-based messaging company with over 171,000 subscribers in the U.S. alone, is working with GO on a link to provide the reliability and expansive coverage of SkyTel's Nationwide Messaging System to PenPoint users. SkyTel provides customizable messaging services across North America and is expanding to Europe and the Pacific Rim.

RAM

RAM Mobile Data is partnering with GO to provide two-way wireless packet-switched radio communications to PenPoint users. A jointly developed driver will provide connections to RAM's Mobitex network through radio modems. For messaging, the Mobitex driver will provide a substitute for dial-up telephone lines and is used in combination with other communication links like the AT&T Mail link.

Software Partners

Pensoft

Pensoft Corporation has developed the Perspective intelligent personal information manager. It combines the functions of a comprehensive paper-based planner, meeting notebook, yellow "sticky" notes and files of correspondence and documents in a single compact product. Perspective can be used as the system-wide address book.

PenMagic

PenMagic Software has developed a financial paper application called Numero. Numero helps you to quickly and correctly perform inventory counts and valuations, prepare expense reports, write up orders and quotations, balance checkbooks, and do typical spreadsheet and other numeric work. Numero's Cooperative Document Architecture makes it possible to establish deferred links between documents. For example, two Numero documents that are linked can reside on separate machines. Using the GO Message Center, the first can be mailed to the second. Numero will reestablish the links, and dynamically update the second document with any changes from the first.

GO

GO Corporation has developed GO™ Fax, an integrated facsimile product for sending and receiving Group 3 faxes. GO Fax lets you fax documents to any standard fax machine in the world, and to any PenPoint computer or PC with a fax modem. You can also receive faxes, mark them up, print them, and fax them back out again. GO Fax takes full advantage of the GO Message Center Address Book, Dialing Location Sheet and In box/Out box.

Others

Companies like WordPerfect, Ink Development, Slate, aha!, Notable, Lotus, and Sitka are developing a broad range of products that work with the GO Message Center. Some, like WordPerfect and Ink, have written applications that can be used as the message body for GO Mail. Others are building replacement components like advanced address books. Many are developing innovative applications that directly integrate the GO Message Center features: spreadsheet-like applications that consolidate and synchronize themselves via e-mail, forms-based applications that update databases through e-mail, documents that can merge information from the address book and other sources, and many others.

For People on the Go

Personal Communicators must make it easy to integrate all your person-to-person communication in one device. The GO Message Center provides an easy, intuitive way to communicate over a broad range of services. Its object-oriented component design offers unlimited development potential for both corporate and commercial software developers. The GO Message Center...for people who need to stay in touch when they're on the go.

Availability

The GO Message Center will be included as a standard part of the PenPoint operating system in the first quarter of 1993. For more information, please call GO Corporation's Customer Services department at 415-358-2040.

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919 East Hillsdale Boulevard, Suite 400
Foster City, CA 94404

015-00055 11/92